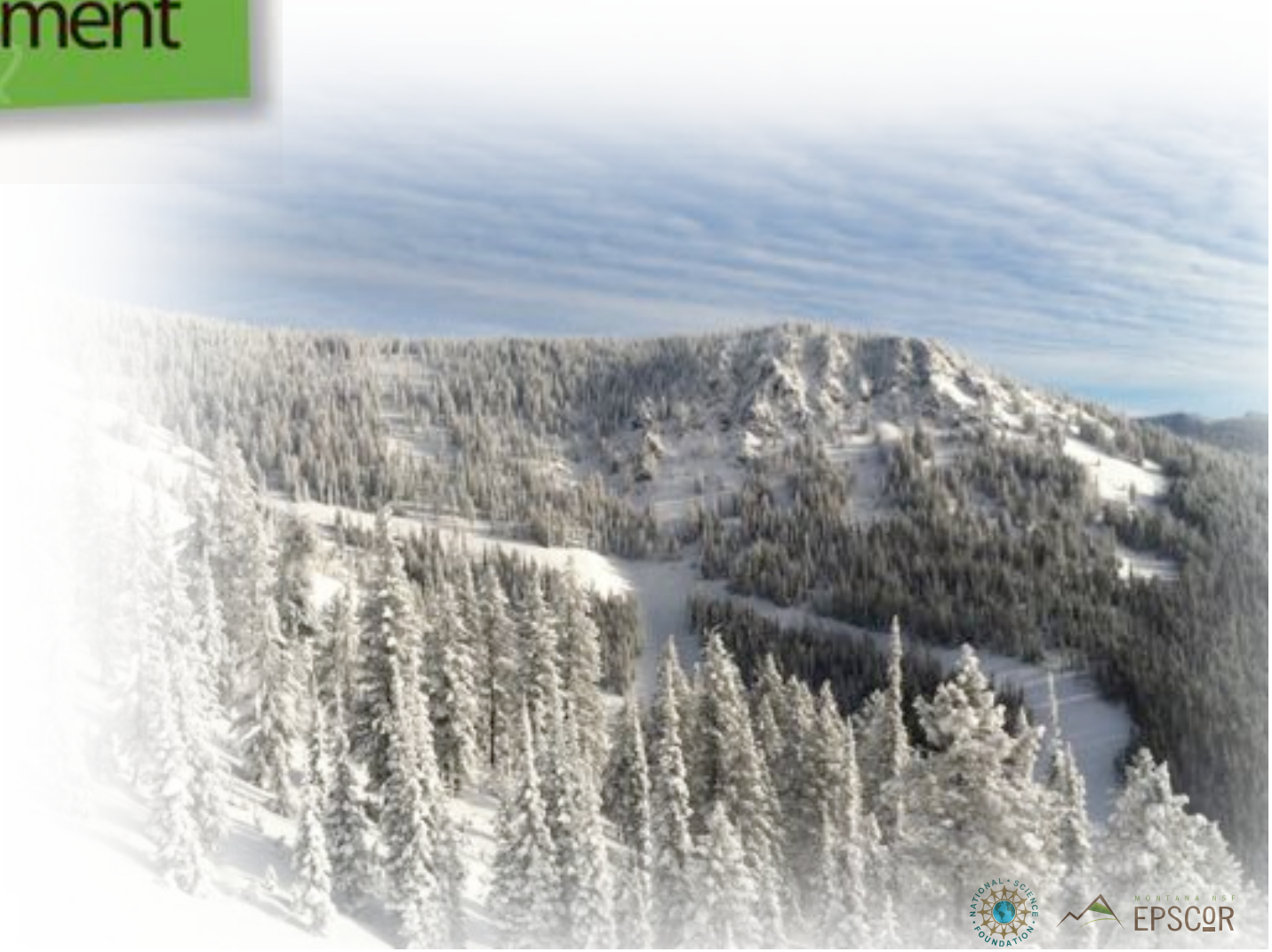
The Montana Climate Assessment



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A Statewide Survey to Gauge Interest

February 2015 (~1000 e-mail addresses):

- MT Institute on Ecosystems affiliates from across state
- Montana Water Center affiliates
- Montana Extension
- Resource managers in federal & state agencies in Montana

March 2015 (378 respondents)

- 31% Gallatin County (Bozeman)
- 15% Lewis & Clark County (Helena)
- 15% Missoula County (Missoula)
- 39% Other counties

YES!

Water
Forests
Agriculture

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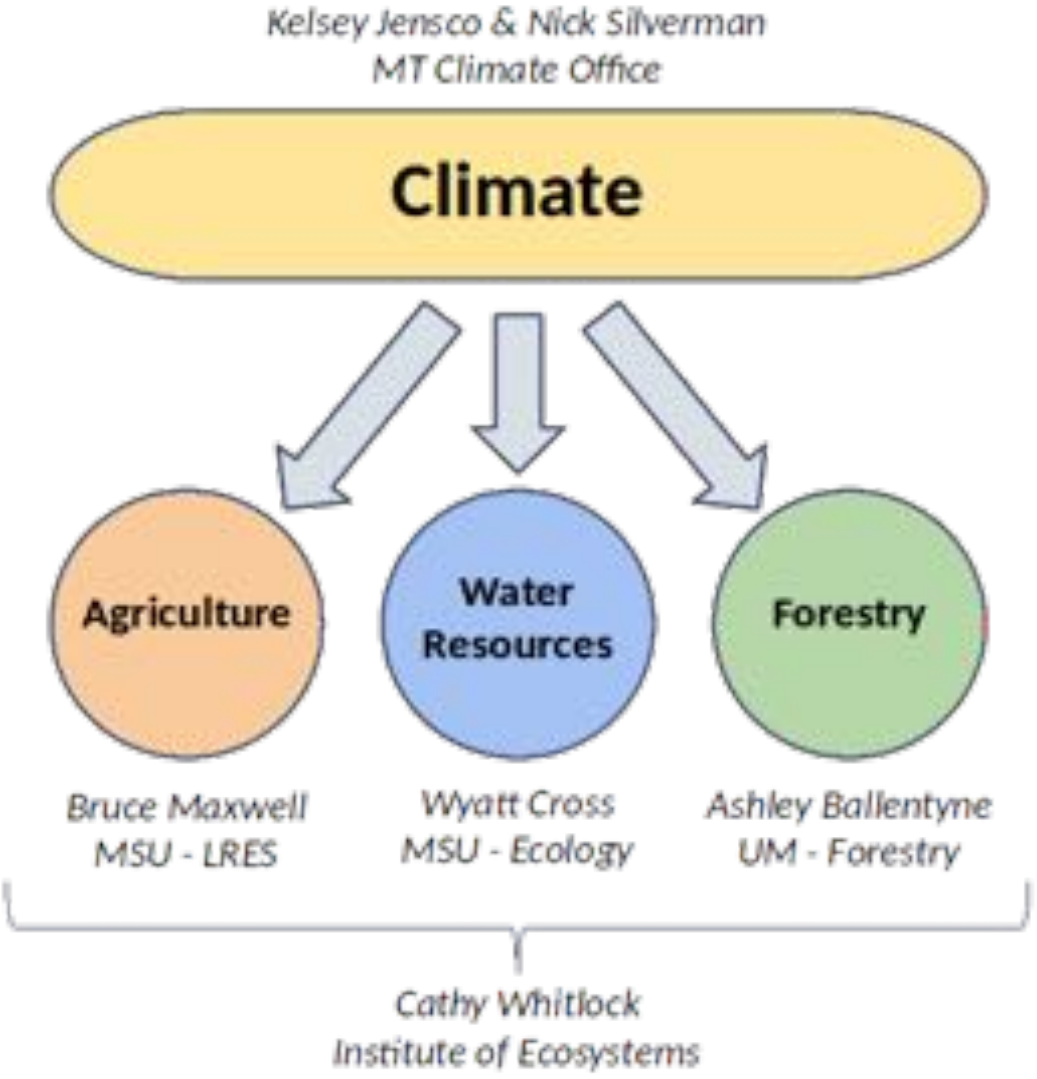
Montana Climate Assessment



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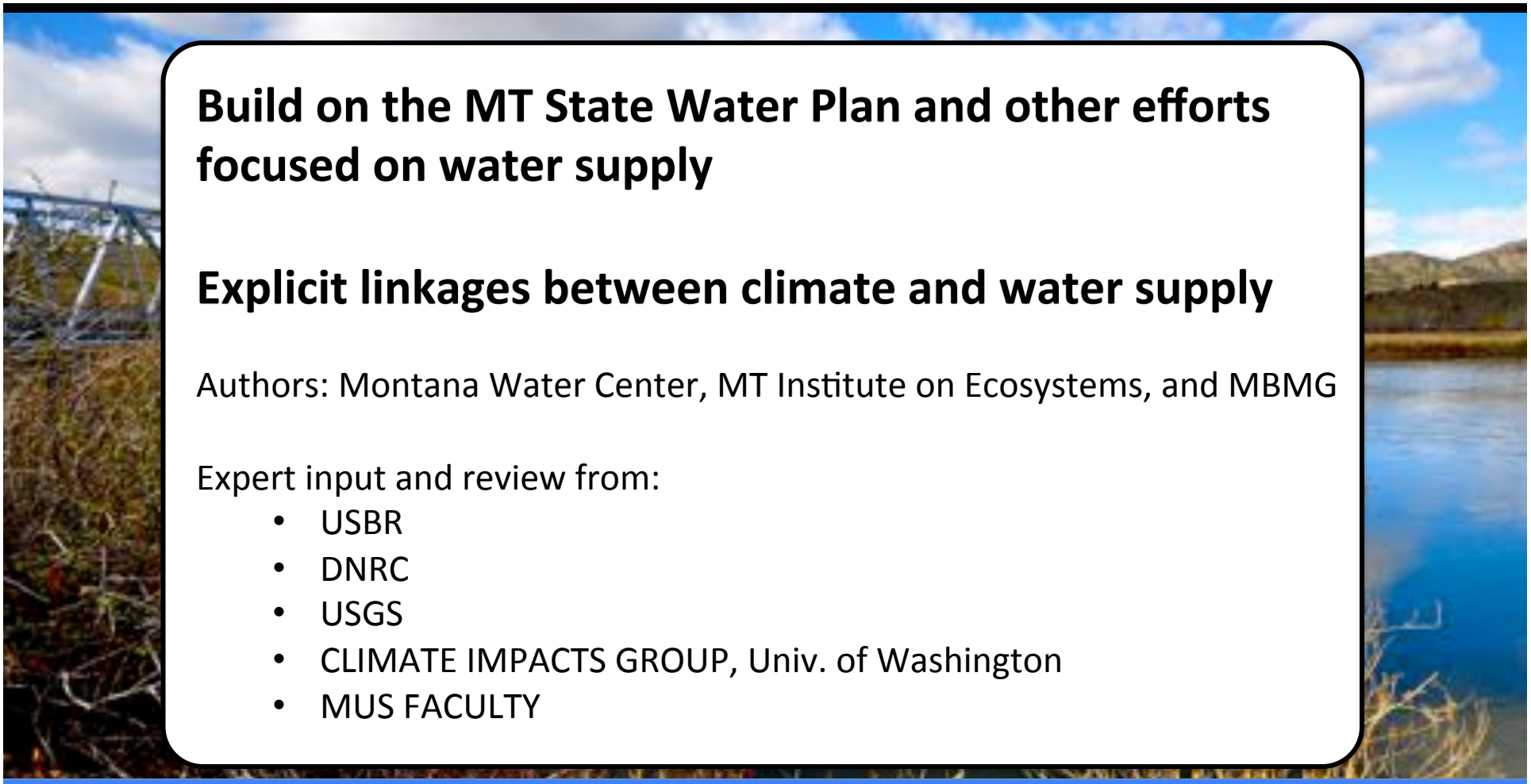
Montana Climate Assessment Partners

Madison River Group LLC

Goals of the MT Climate Assessment

- Provide **localized climate information** (past and projected)
- Review the **state of knowledge** about climate change in Montana and the region
- Describe **climate models and uncertainty** in an accessible way
- Incorporate **stakeholder input** about priorities for assessment
- Ensure **a sustainable process** so Montanans have on-going access to up-to-date information

MCA Water Sector Report



Build on the MT State Water Plan and other efforts focused on water supply

Explicit linkages between climate and water supply

Authors: Montana Water Center, MT Institute on Ecosystems, and MBMG

Expert input and review from:

- USBR
- DNRC
- USGS
- CLIMATE IMPACTS GROUP, Univ. of Washington
- MUS FACULTY

Whitney Lonsdale, Alex Leone, Alisa Royem, John Lafave, Tom Patten
Montana Water Center, Institute on Ecosystems, MBMG

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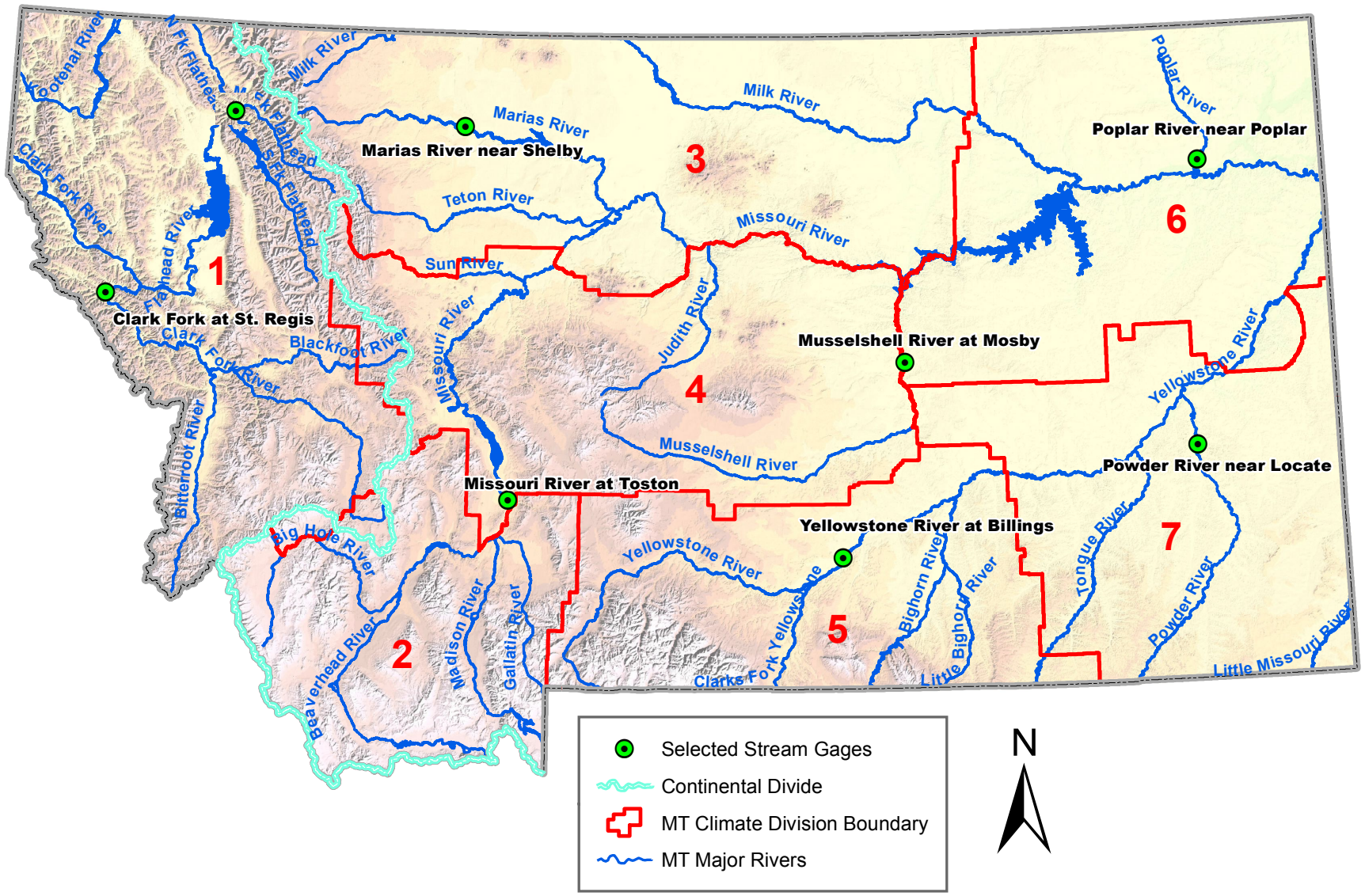
Focal Rivers and Watersheds



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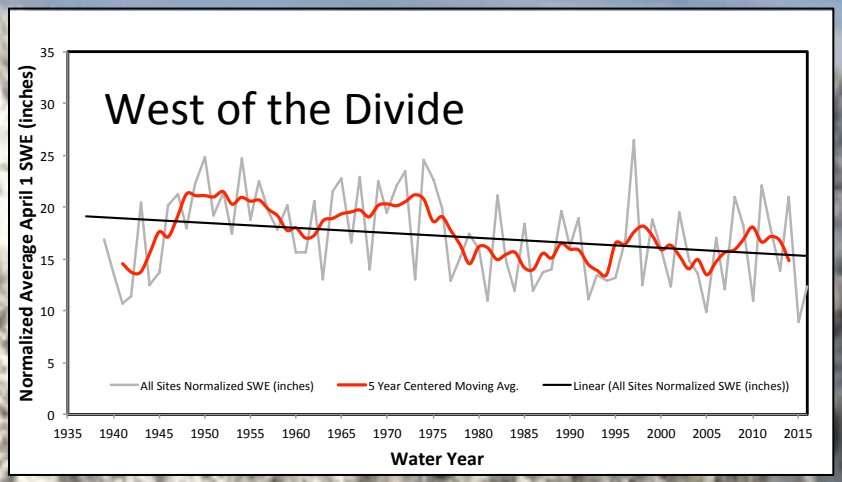
Water Sector Report Topics

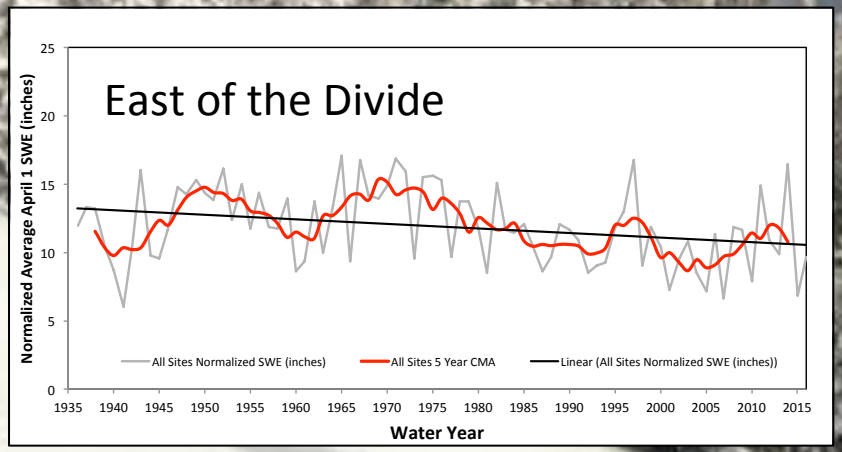
Snowpack
Snowmelt & runoff timing
Total annual streamflow
Groundwater
Drought

Vignettes:
Our Disappearing Glaciers
Upper Missouri Headwaters Study
Stream Temperature projections for MT
Building Drought Resilience in Montana

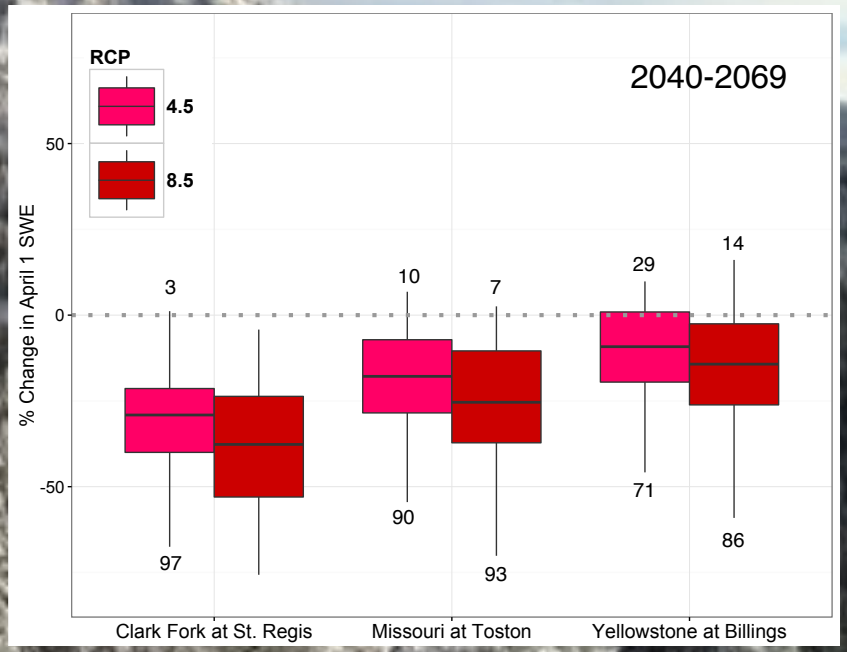
SNOWPACK

Historic record of snowpack in MT



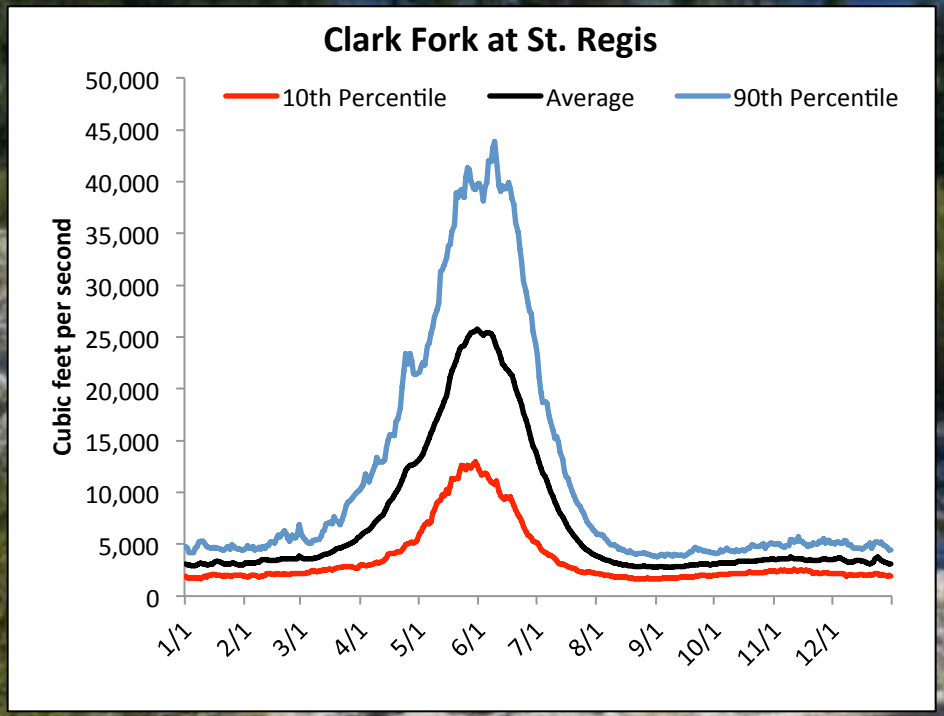


Projected changes by watershed

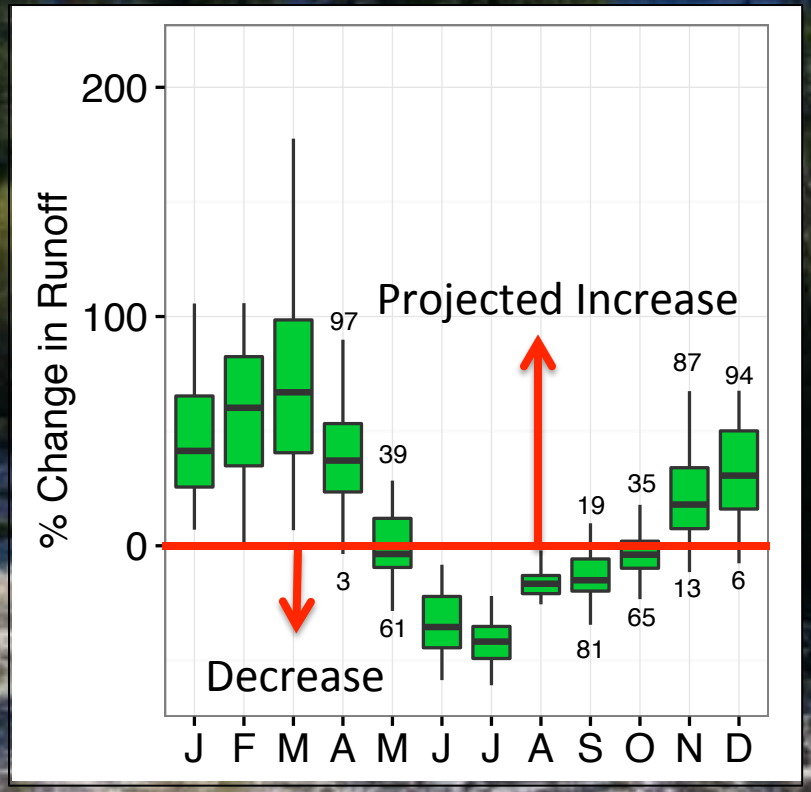


SNOWMELT AND RUNOFF TIMING

Historic patterns of runoff timing



Projected changes in runoff



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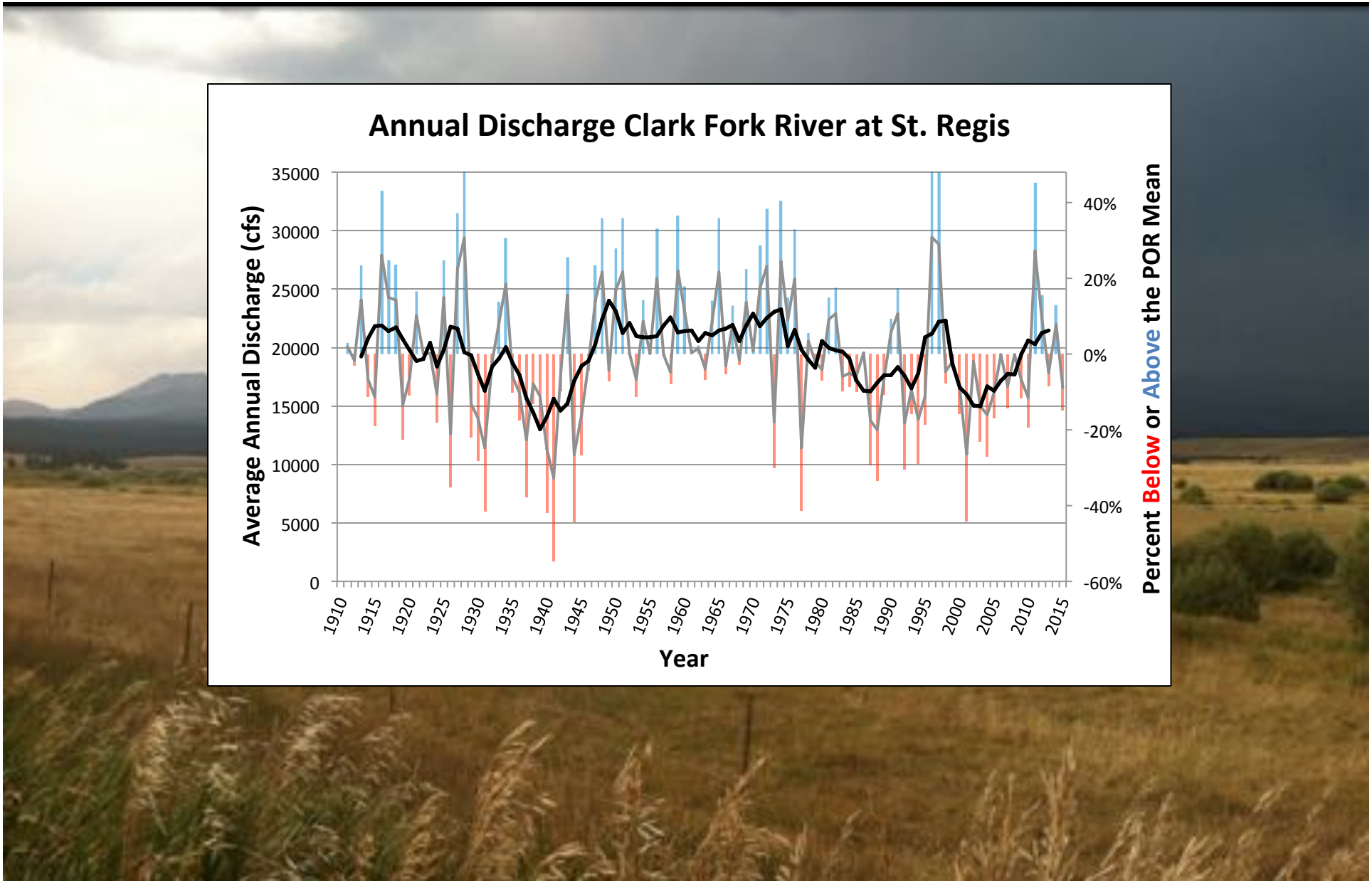
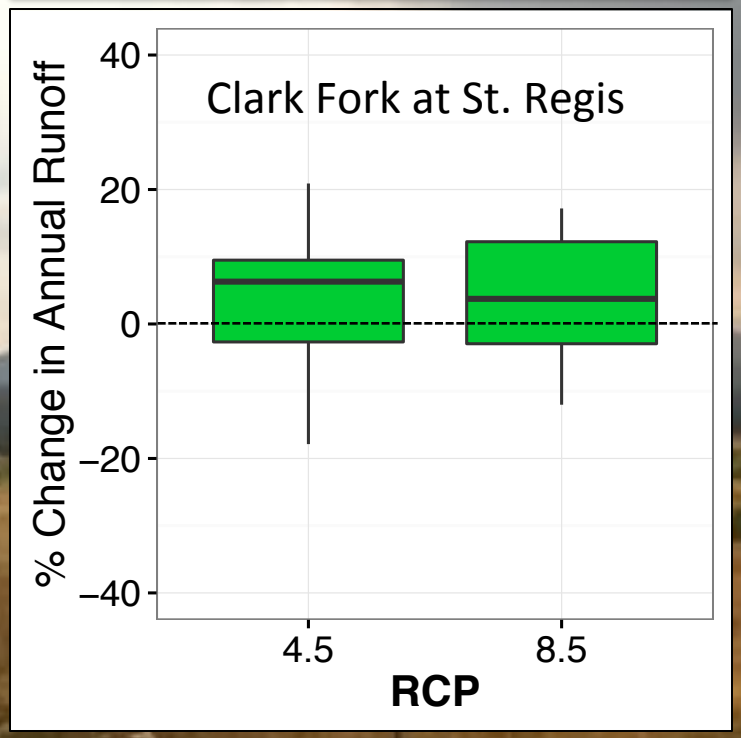
TOTAL ANNUAL STREAMFLOW

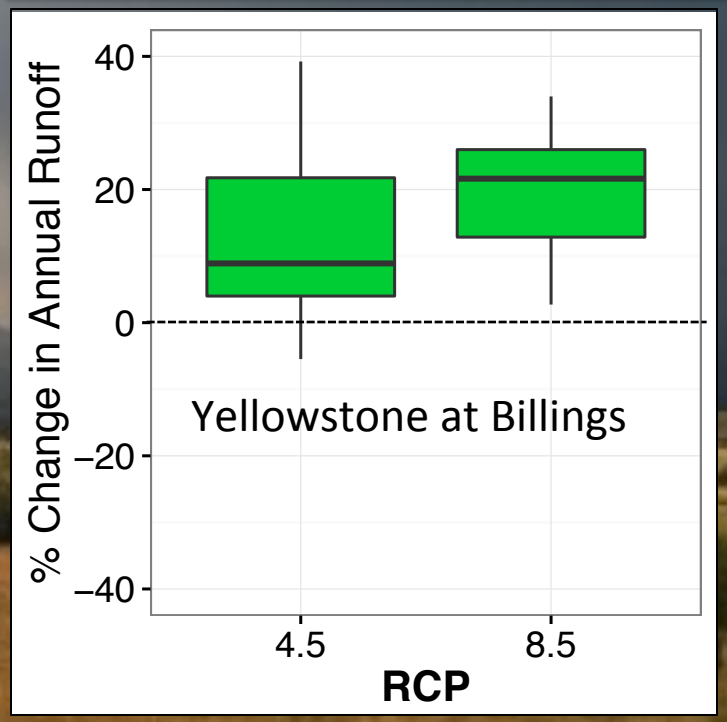


TOTAL ANNUAL STREAMFLOW

High uncertainty about the future



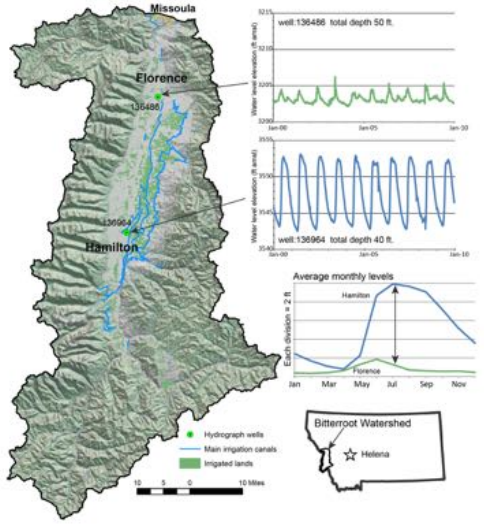
High model agreement



GROUNDWATER

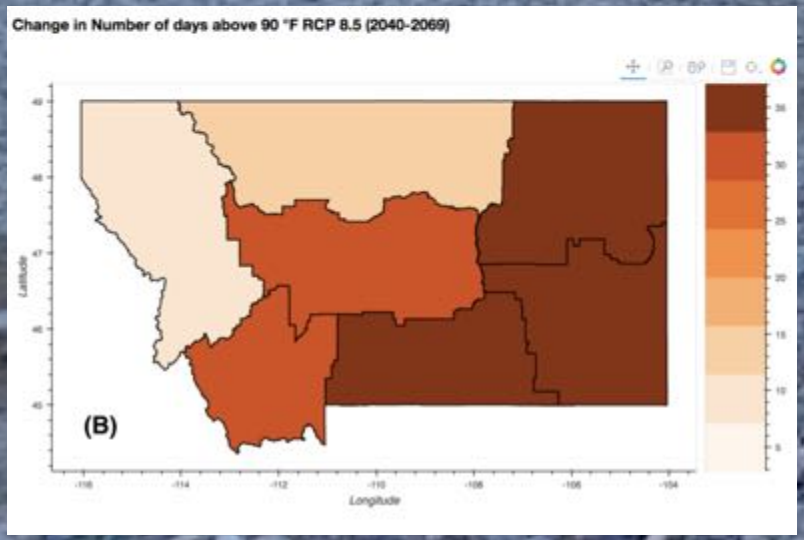
Groundwater aquifers show varied responses to changes in climate

- **Highly responsive to inter-annual precipitation**
- **Stable and buffered by irrigation**
- **Long-term reductions due to withdrawals**



DROUGHT

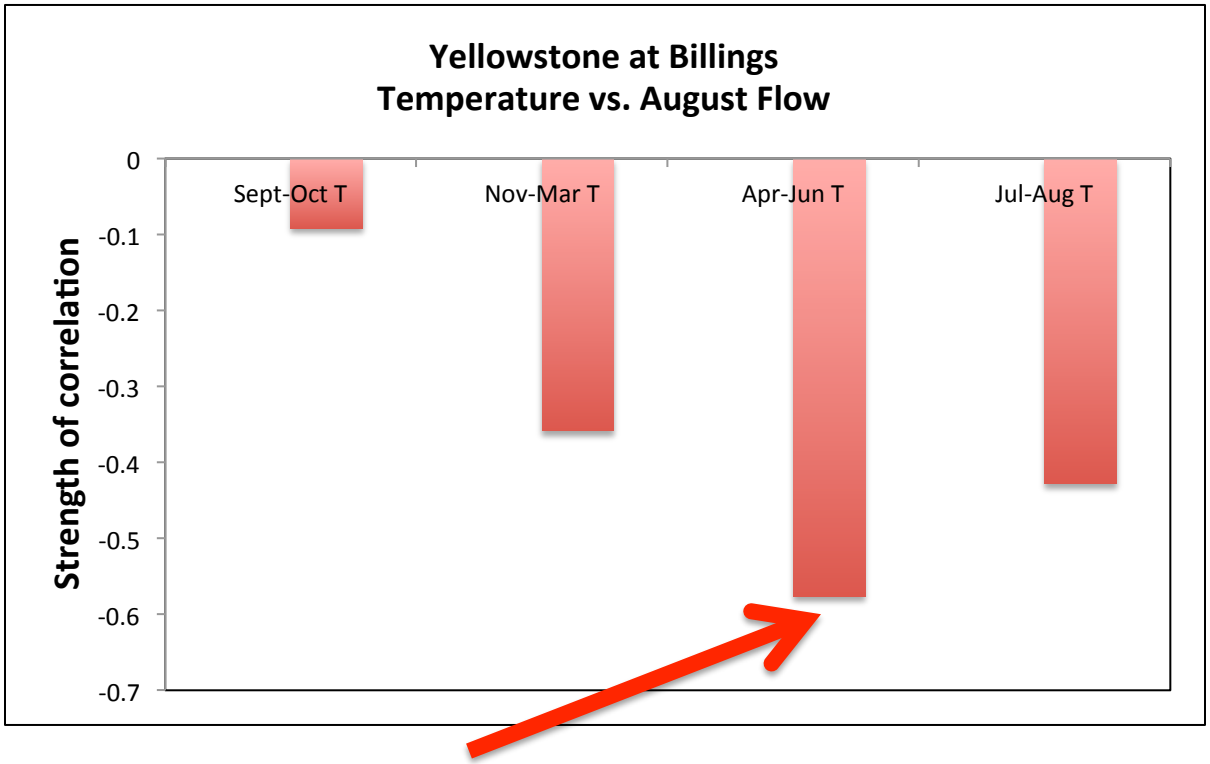
Rising temperatures will exacerbate drought when and where it occurs



An increased number of days > 90°F is predicted for all climate regions

Seasonal Drought

Seasonal summer drought is likely to increase in frequency and duration



Warm spring temperatures lead to low August Flows

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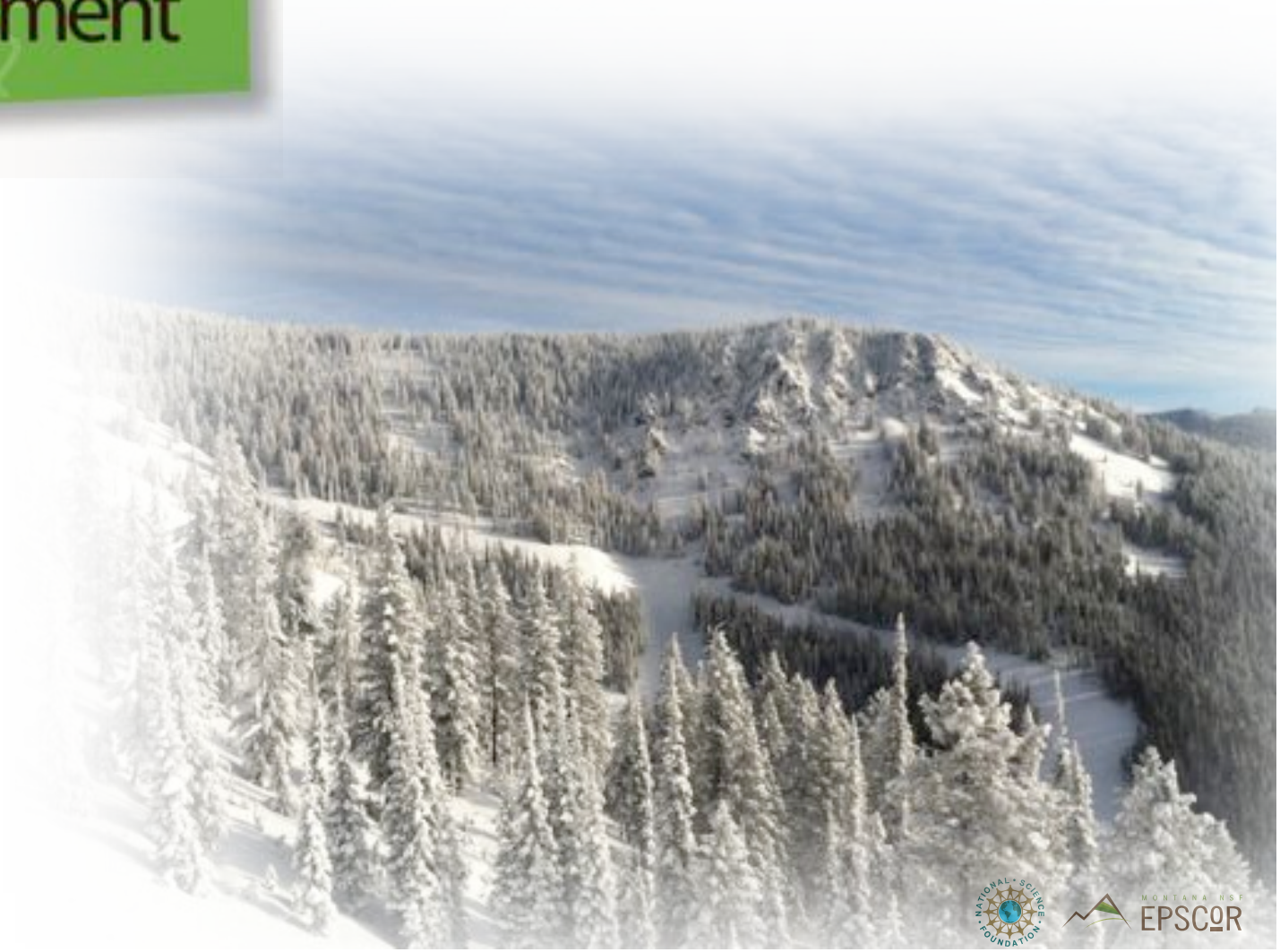
The Montana Climate Assessment

Official Launch in August 2017



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